REMARKS

Applicant notes there is an outstanding Petition To Correct Inventorship mailed November 3, 2004 and listed on PAIR with a November 8, 2004 date. Applicant requests that this petition be processed.

Reexamination and reconsideration of the application as amended are requested.

Please see the enclosed Declaration Under Rule 132 of Foster B. Stulen in support of the following remarks.

The Examiner's rejection of claims 1-32 as being "obvious", under 35 U.S.C. 103, is respectfully traversed. The Examiner rejects these claims as being unpatentable over Okazaki '580 or Lizzi '726 and, as required, in view of Dory (US 5,534,258), Cain (US 5,590,657), Geiser (US 6,106,470), and/or Fujimoto (US 6,540,700). In view of the amended claims, the "further in view of " Watkins and Acker references add nothing to the claim rejection.

The independent claims 1, 13, 16, 25 and 30 require subtracting a second time-varying signal (or imaging signals of a second image frame or of a second set of image frames) from a first time-varying signal (or imaging signals of a first image frame or of a first set of image frames) to derive a time-varying difference signal (or a set of time-varying difference signals). The Okazaki and Lizzi patents, taken alone or in combination, do not teach, suggest or describe this.

Two items are key to understanding the difference between the claims and the Okazaki and Lizzi patents. One is to understand that two time-varying signals from the same location are being subtracted in the claims whereas two signal-amplitude-dependent image pixel values from the same location in two images are being subtracted in the Okazaki and Lizzi patents. The other is to understand that the term "amplitude" as used in the Okazaki and Lizzi patents means a number, such as a peak amplitude or an average amplitude, which is time-invariant (fixed) for a particular time-varying signal (but which can change for the next time-varying signal).

The Okazaki and Lizzi patents each: determine a first time-invariant amplitude value (such as a maximum amplitude value from a normal or equilibrium value taken as zero or an RMS [root-mean-square] average amplitude value, etc) of the first time-varying signal; then determine a second time-invariant amplitude value of the second time-varying signal; and then subtract the second time-invariant amplitude value from the first time-invariant amplitude value to derive a time-invariant number (for that particular pair of time-varying signals), wherein the time-invariant number is used to determine a gradation value of a pixel of a location in an image and wherein the pixel gradation value is a fixed value until new signals are received and processed. The subtraction in the claims yields a time-varying signal whereas the subtraction in the Okazaki and Lizzi patents yields a fixed (time-invariant) number.

Okazaki discloses subtraction of the amplitude of two signals. Okazaki teaches detecting the amplitude of the signals (see column 3, lines 22-25) which a signal converting system outputs as tomogram data to an image memory (see column 3, lines 39-41), and a subtraction image is formed from the stored tomogram data (see column 3, lines 41-44). Tomogram data is fixed amplitude data from particular signals (which can change for later signals). Okazaki teaches that a pixel gradation value for a location (see the particular level of gradation lightness or darkness for a particular pixel location in Okazaki's figure 4C) is derived by subtracting a fixed amplitude value of a same-particular-location-reflected time-varying second signal during treatment (see the particular level of gradation lightness or darkness for a same particular pixel location in Okazaki's figure 4B) from a fixed amplitude value of a same-particular-location-reflected time-varying first signal (see the particular level of gradation lightness or darkness for a same particular pixel location in Okazaki's figure 4A) before treatment.

Lizzi teaches subtraction of image scans (see Lizzi's blocks 340 and 345) which, for a particular pixel location in an image scan, are subtractions of fixed amplitude values of signals identical to the teaching of Okazaki. Subtraction of image scans is subtraction of images (see the Abstract of Lizzi) which is the subtraction of signal-amplitude-dependent pixel values.

The subtraction in Okazaki and/or Lizzi is derived from the time-invariant amplitude values of a particular before-treatment signal (i.e., a first signal) and a particular during-treatment

signal (i.e., a second signal) and is a fixed number and is not a time-varying difference signal. A different fixed number for Okazaki and/or Lizzi can be derived by subtracting the time-invariant amplitude values of an additional new third signal and the previous second signal or by subtracting the time-invariant amplitude values of additional new third and fourth signals. However, subtracting fixed amplitude values of third and second signals or fixed amplitude values of third and fourth signals to derive a different fixed number from the fixed number derived by subtracting fixed amplitude values of first and second signals is not subtracting a time-varying second signal from a time-varying first signal to derive a time-varying difference signal.

A question might be raised whether the difference in time-invariant amplitude values of two time-varying signals is the same as a time-invariant amplitude value of the difference of two time-varying signals. The answer is no (see page 8, lines 4-7 of the specification). For example, consider a time-varying sine wave signal [y1=sin(x) where x is time] having a fixed amplitude value of one and a time-varying cosine wave signal [y2=cos(x)] having a fixed amplitude value of one. The difference in the fixed amplitude values of the two signals is zero. However, subtracting the cosine wave signal from the sine wave signal results in a signal [y3=sin(x)-cos(x)] which has a fixed amplitude value of about 1.4 which is not a fixed amplitude value of zero. It is noted that Attachment A of the Amendment After Final was a graph of sin(x), cos(x) and sin(x) – cos(x).

Inasmuch as each of the rejections has been answered by the amended claims and above remarks, it is respectfully requested that the rejections be withdrawn, and that this application be passed to issue.

Respectfully submitted,

Douglas E. Erickson

Douglas E. Erickson
Reg. No. 29,530

THOMPSON HINE LLP

2000 Courthouse Plaza NE

10 West Second Street

Dayton, Ohio 45402-1758

(937) 443-6814

475073